

CLAIMS

What is Claimed is:

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1. A method of pacing a patient's heart using an implantable cardiac stimulation device, the method comprising:
pacing the heart at a selected pacing rate;
monitoring for intrinsic heart beats; and
increasing the pacing rate if at least two intrinsic heart beats
10 are detected within a predefined period.
2. The method of claim 1 wherein the predefined period extends for a predetermined number of overdrive paced cycles.
- 15 3. The method of claim 1 wherein the predefined period commences with a first detected intrinsic beat.
4. The method of claim 1 wherein the predefined period ranges between about 8 and about 40 cycles.
- 20 5. The method of claim 1 wherein the predefined period begins with a first paced beat.
6. The method of claim 1 wherein the predefined period is
25 about 10 cycles.
7. The method of claim 1 further comprising decreasing the overdrive pacing rate by a determined rate decrement if at least two intrinsic heart beats are not detected within a second predefined period.
- 30 8. The method of claim 7 wherein the second predefined period begins following an increase in the overdrive pacing rate.

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9. The method of claim 7 wherein the second predefined period is between about 8 and about 40 cycles.

5 10. The method of claim 1 wherein increasing the pacing rate comprises increasing the pacing rate between about 5 and about 25 paces per minute.

10 11. The method of claim 7 wherein the determined rate decrement ranges between about 1 and about 5 paces per minute.

15 12. The method of claim 1 further comprising:
determining a sinus rate; and
setting the selected pacing rate to be equal to the sinus rate.

20 13. The method of claim 11 wherein determining the sinus rate comprises:
detecting at least three consecutive sinus P-waves;
determining an average interval between the P-waves; and
calculating the sinus rate based upon the average interval.

25 14. The method of claim 11 further comprising periodically re-determining the selected pacing rate by:
suspending pacing at the selected pacing rate;
detecting at least three consecutive P-waves while pacing is suspended;
determining an updated sinus rate based upon the at least three consecutive P-waves; and
30 setting the selected pacing rate based upon the updated sinus rate.

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15. The method of claim 1 further comprising:
determining an atrial rate; and
setting the selected pacing rate to be equal to the atrial rate.

16. The method of claim 15 further comprising:
periodically determining an updated atrial rate;
comparing the updated atrial rate with a current pacing rate;
and

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if the updated atrial rate exceeds the current pacing rate by
a determined amount, resetting the selected pacing rate to be
equal to the updated atrial rate.

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17. A system for controlling pacing of a heart using an
implantable cardiac stimulation device configured for connection to a
patient's heart, the system comprising:

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means for determining an overdrive pacing rate;
means for pacing the heart at the overdrive pacing rate;
means for detecting intrinsic heart beats while pacing; and
means, responsive to detection of at least two intrinsic heart
beats within a predefined period, for increasing the overdrive
pacing rate.

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18. An implantable cardiac stimulation device for controlling
pacing of a patient's heart, the system comprising:

a determination unit that is operative to determine an
overdrive pacing rate;

an overdrive pacing unit that is operative to pace the
patient's heart at the overdrive pacing rate;

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a detection unit that is operative to detect intrinsic heart
beats; and

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an increment unit that is operative to increase the overdrive pacing rate in response to detection of at least two intrinsic heart beats within a predefined period.

5 19. The device of claim 18 wherein the predefined period extends for a predetermined number of overdrive paced cycles.

10 20. The device of claim 18 wherein the predefined period begins with a first detected intrinsic beat.

15 21. The device of claim 18 wherein the predefined period ranges between about 8 and about 40 cycles.

20 22. The device of claim 18 wherein the predefined period begins with a first paced beat.

25 23. The device of claim 18 wherein the predefined period is about 10 cycles.

30 24. The device of claim 18 wherein the increment unit is further operative to decrease the overdrive pacing rate by a determined rate decrement if at least two intrinsic heart beats are not detected within a second predefined period.

 25. The device of claim 24 wherein the second predefined period begins following an increase in the overdrive pacing rate.

 26. The device of claim 24 wherein the second predefined period is between about 8 and about 40 cycles.

 27. The device of claim 18 wherein the increment unit increases the pacing rate by about 5 to about 25 paces per minute.

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28. The device of claim 24 wherein the determined rate decrement ranges between about 1 and about 5 paces per minute.

5 29. The device of claim 18 wherein the determination unit calculates the overdrive pacing rate as a function of an intrinsic pacing rate.

10 30. A method of pacing a patient's heart using an implantable cardiac stimulation device, the method comprising:
pacing the heart at a selected pacing rate;
monitoring for intrinsic heart beats; and
increasing the pacing rate by a predetermined increment if
at least two intrinsic heart beats are detected within a predefined
15 period.

31. The method of claim 30 wherein the predefined period extends for a predetermined number of paced cycles.

20 32. The method of claim 30 wherein the predefined period commences with a first detected intrinsic beat.

33. The method of claim 30 wherein the predefined period ranges between about 8 and about 40 cycles.

25 34. The method of claim 30 wherein the predefined period begins with a first paced beat.

30 35. The method of claim 30 wherein the predefined period comprises a predefined period of time.

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36. An implantable cardiac stimulation device for pacing a patient's heart, the system comprising:

a determination unit that is operative to determine an overdrive pacing rate;

5 an overdrive pacing unit that is operative to pace the patient's heart at the overdrive pacing rate;

a detection unit that is operative to detect intrinsic heart beats; and

10 an increment unit that is operative to increase the overdrive pacing rate by a predetermined increment in response to detection of at least two intrinsic heart beats within a predefined period.

37. The device of claim 36 wherein the predefined period extends for a predetermined number of cycles.

15 38. The device of claim 36 wherein the predefined period ranges between about 8 and about 40 cycles.

20 39. The device of claim 36 wherein the predefined period is about 10 cycles.

40. The device of claim 36 wherein the predefined period comprises a predefined period of time.

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